3.8-3.12 Test Review

Name _____ Date _____ Period _____

Use identities to simplify each expression.

1. $\dfrac{\tan x \csc x}{\sec x}$

2. $\tan^2 x - \dfrac{\sin(-x)}{\sin x}$

3. $\csc x \tan x + \sec(-x)$

4. $(1-\csc x)(1-\csc(-x))$

Multiply and simplify:

5. $\sin\theta\cos\theta(\tan\theta+\cot\theta)$

Factor and simplify:

6. $\cos^2 x \tan^2 x + \cos^2 x$

Verify each identity:

7. $\dfrac{\sin x \cos x}{\tan x} = 1-\sin^2 x$

8. $\cot(-x) = \dfrac{1-\sin^2 x}{\cos(-x)\sin(-x)}$

9. $\dfrac{\sin 2\beta}{2\csc\beta} = \sin^2\beta\cos\beta$

10. $\dfrac{1}{\sec\theta-1} - \dfrac{1}{\sec\theta+1} = 2\cot^2\theta$

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11. $\cos(3x) = \cos x(1 - 4\sin^2 x)$

12. $\sin^2\left(\frac{x}{2}\right) = \frac{\csc^2 x - \cot^2 x}{2\csc^2 x + 2\csc x \cot x}$

13. Use trigonometric identities to find the values of the other five trigonometric functions if $\cos\alpha = 1/\sqrt{5}$ and α is in quadrant IV.

Find the exact value by using a sum or difference identity:

14. $\cos\left(\frac{7\pi}{12}\right)$

15. $\sin\left(\frac{\pi}{12}\right)$

16. tan 165°

17. cos(75°)

Use the sum/difference identities to simplify each expression.

18. $\cos 75° \cos 60° - \sin 75° \sin 60°$

19. $\sin 80° \cos 50° - \cos 80° \sin 50°$

20. Find $\sin(A + B)$ if $\sin A = -5/13$ and $\cos B = 2/5$, with A in quadrant III and B in quadrant I.

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21. Find $\cos(\alpha-\beta)$ if $\sin\alpha=15/17$ and $\sin(\beta)=-1/3,$ with α in quadrant II and β in quadrant IV.

Find the exact value by using a half-angle identity.

22. $\sin\left(-\frac{\pi}{8}\right)$

23. $\tan\left(\frac{3\pi}{8}\right)$

Use the given information to find the exact value of the trigonometric function.

24. Find $\cos\left(\frac{\alpha}{2}\right)$ if $\cos\alpha=\frac{1}{4},$ and α is in quadrant IV.

25. Find $\sin\ 2\theta$ if $\sin\ \theta\ =\frac{5}{13},$ and θ is in quadrant II.